

Commentary
The Female Brain
Cynthia Darlington
Taylor & Francis, London and New York, 2002/2009
Gender and the Science of Difference
Jill A. Fisher (Ed.)
Rutgers University Press, New Brunswick (NJ), 2011

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Mental woman, born of man
Born of woman, mental man
Change me, I'm changing day to day
Lady, I'm a lady from today
Ariel Pink's Haunted Graffiti, *Menopause man*

The clever chiasmus in the opening lines of the song *Menopause Man* illustrates the complexity of the topic faced by the authors of *The Female Brain* and the collected work *Gender and the Science of Difference*.

The two volumes are about the understanding of *Sexing the Body* – about ‘dueling dualisms’, to borrow a term used over ten years ago by Anne Fausto-Sterling. In other words, they are about «the relation between *social expression* of masculinity and femininity and their *physical underpinnings* [that] has been hotly debated in scientific and social arenas»¹ for several decades. Before focusing the attention on the contents of these books, it could be worth to underline that, when we look at the topics of sexual difference and/or gender difference, the development of concepts that could enable us to integrate and uphold a coherent whole out of the mountain of empirical research in the cognitive sciences has been lagging behind. This lack of notions has been the cause of some serious political and ideological ambiguities and misunderstandings in the interpretation of the mentioned researches. Still, the

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¹ Fausto-Sterling, 2000, p. 3.

ambition of building a scientific paradigm on the basis of any empirical knowledge always presupposes a vocabulary that includes strong explanatory potential. Likewise, it is necessary to understand that neuroscience just like any other discipline, represents *knowledge in the making* (where the gerund points at the incompleteness and openness of accumulating knowledge).

The Female Brain was written by Cynthia Darlington, professor of Neuroscience, trained in psychology and neurophysiology. *Gender and the Science of Difference* was edited by Jill A. Fisher, who holds a PhD in science and technology studies and who currently is an Assistant Professor at the Center for Biomedical Ethics. The latter book contains contributions by both researchers in science and the humanities.

In what follows, I will firstly present certain key aspects of *The Female Brain*, and then *Gender and the Science of Difference* as well. In the main core of my comment, the intention will be to connect the two books through an analysis of their epistemological premises and point out the need for surgically accurate linguistic tools that follow behind. Such tools are necessary instruments in order to interpret the ‘world’ of (sexual and/or gender) difference in more persuasive and complete manner.

According to its author, *The Female Brain* originated as a response to the need of collecting in one book a series of issues that concern the brain structure and functions – only supposed to be neutral in terms of sex – about the biological origin of certain phenomena (such as the hypothesis that the women are more monogamous or less competitive than man or the relation between the universal codes of beauty and female forms, etc.) that she had to explain to her students. Consequently, beside the description of different factors such as genes, hormones or neurotransmitters that initiate sexually differentiated processes and their functionality, the author had to find a didactically efficient way of transmitting this knowledge to her students as well as the best form of communicating it in one emerging scientific discipline like neuroscience.

She thus studied the physiological factors that can influence neuron activity and asked herself along with her students: to what extent – if any at all – does the sex of the animal under observation condition the result of the experiment that is carried on? In the introduction to her book, Darlington writes that for practical reasons and in an attempt to obtain stable results the experimental animals were almost always males («females tend to be inconsistent in their responses as a result of the oestrous cycle», p. 2). She noticed that experiments

conducted in this way, guided by a long-term need of efficiency and stability in research, contributed to disregard and neglect certain changes that could be noticed if the different sex is taken into account. Motivated by the endeavor to articulate «the issue of basic biological differences between the sexes, in terms of brain function,» Darlington consequently stated that the biological sexual difference actually «has been clouded by issues of gender» (p. 2). Indeed, anticipating what in an increasing number of studies will become the heated concept of *plasticity of the brain*, she wrote that «differences may arise as a result of different brain structure or from virtually the same brain structure performing in different ways» (p. 2). More complicated still, but also more interesting, somewhat different structures can have marginally different ways of manifesting. It is not far from the truth that the intuitions that led Darlington to research the biological sexual differences were certainly correct. Still the problem here is exactly the fact that an established (but unsuited) vocabulary is too quickly imposed, and that this imposition biases, so to say, the results of the emerging study.

In the first two chapters she puts forward the basic physiological terminology, and then recounts the “history of the study of the female brains.” Chapters from three to eight examine specific aspects of the structures of the brain, based on empirical evidence of the difference between so-called ‘female’ and ‘male’ brains. More precisely, the Third chapter highlights structural changes, while the Fourth documents the functional differences through descriptions of neurotransmitters and their receptors. Despite noticing the difficulty of separating structure from function, the author continues her exposition in the Fifth chapter examining the functional asymmetry of the brain through the dichotomy: male/female and left/right. Chapter Six explores differences in male and female perception, while chapter Seven thematizes neurological and psychiatric disorders that make visible neuronal particularities of different sexes. Chapter Eight introduces the role of hormones in treating certain neurophysiological disorders, which leads to the establishment of new variables that takes into account e.g. hormonal changes provoked by pregnancy, which are opposite to results arrived at during the studying of male animals. The old convention of universally applicable results of the experiments on male animals thus became non relevant. The book ends with a chapter of guidelines for future work in distinguishing the ‘female’ from the ‘male’ brain.

By the contrast, *Gender and the Science of Difference*, with its subtitle *Cultural Politics of Contemporary Science and Medicine*, was motivated, as mentioned, by the provocation to establish a ‘science of difference.’ The editor of the collection is careful to put at the same discursive level both ‘gender’ and ‘science of difference’ topics, by measuring their arguments in the larger historical and contemporary contexts. The reader is offered four parts that encompass various current critical analyses from humanities, science and medicine. The introductory section examines and evaluates the epistemological and methodological aspects of biological difference and gender. The paper by Lesley J. Rogers, “Sex Differences Are Not Hardwired,” cleverly deconstructs opposing explanations of *causes* of sexual difference, moving away from the simple «nature versus nurture dichotomy» (p. 27) and pointing out the old trappings of determinism, whether in genetics or in evolutionary psychology. Unlike ‘unitary explanations’ (stating that genes are the main cause of sex differences: «men and women are made in fundamentally different ways»²) the author borrows examples from experimental sciences and zoology, and suggests ‘interactive explanations’ of the causes of sex differences that examine the interaction between genetic and epigenetic (experience) influences on the development of behavior. Assuming that “methodology is in the eye of the beholder,” or in other words, that the examination of sexuality, sex and gender differences is first and foremost subject to ‘judgmental stances,’ Bonnie B. Spanier and Jessica D. Horowitz analyze the conceptual mistakes in the claims of biological determinism. They strongly contend with the famous McFadden research and the CEOAE study (“click-evoked otoacoustic emissions,” 2008, pp. 48–60), which purports to «determine the subject’s sexual orientation based on specific auditory functions».

The second part of the book deals with “Animal Obsessions”, presenting—in the first paper—what is happening with experimental animals in laboratories and how feminists respond to this phenomenon. “Telling the Rat What to Do” by Lynda Birke tackles the cultural expectations of gender and sexual behavior where «the supposition of ‘typical’ sexually dimorphic behavior based in biology has been exacerbated by the use of limited testing conditions, which do not permit animals to show their full range of behavior» (p. 97). Arguing that the claims of biological difference are legion, she is challenging the possibility of acknowledging the seemingly rare idea that even lab rats have social lives

² See: Bainbridge, 2003, p. 33.

shaping their development (and therefore experimental outcomes). The next study in the section aiming to question sexual behavior in animals “Why do Voles fall in love?” by Angela Willey and Sara Giordano, describes sexual dimorphism in “Monogamy Gene Research”. Smilla Ebeling and Bonnie B. Spanier, by asking why there would be gay penguins, adventure the analysis of penguins’ – not without the zests of irony – ‘socially constructed gender roles’ and ‘politics’ in the animal world as well. Their

examination of gay penguins in zoos illustrated the close intertwining and even co-construction of popular science and societal norms, raising questions about just how objective popular (and even perhaps formal) science can be on topics close to (human animal) home (thus comparing the issue of politics in relation to scientific objectivity) (p 140).

The third part of the book concerns the issue of the categorization of the body and, in particular, the problem of how to categorize those bodies that do not fit into the traditional framework of gender and/or sex binaries. The fourth and last part of the book faces the paradoxes of contemporary medical procedures that are not plastic surgeries in the usual sense, but rather so-called “facial feminization surgery,” when there is a change in gender, but not a radical change in sex. This technique represents an invasive and expensive though uncertainly successful intervention that still remains highly sought by male-to-female transsexuals. By contrast, female-to-male transsexuals achieve masculinization of the face through hormone therapy avoiding surgery. This section of the book also focuses on obesity and on research about the extent to which obesity is a hereditary disorder. The last text in the book problematizes male sexuality and its manifestation making reference to the research conducted at the *Instituto Mexicano del Seguro Social* hospital in Cuernavaca on ‘Hybrid Medical knowledge’ and urological problem know as the ‘Erectile Dysfunction’. The author observes how the discourses on ‘mature’ masculinity (or machismo) provoke the contradiction when the need for the ED (Erectile Dysfunction) drug treatment appears on the surface.

Gender and the Science of Difference is undoubtedly an important piece of work, precisely because one of its main features is a discussion of *knowledge in the making*. This phrase marks a dynamic epistemological approach, which takes as its point of departure the stance that the production of knowledge, this time on ‘difference,’ demands an ‘increased explanatory power’ and the improvement of scientific justification when the human and non-human sexuality are discussed. In this sense, the vocabulary that grounds it should also

challenge linguistic stereotypes such as binary couples male/female, passive/active, strong/weak. And although the author of *The Female Brain* had a similar motivation, her intention was thwarted by the need to oversimplify (and reduce) a very large amount of scientific data, placing facts into concepts that rely primarily on largely circumstantial evidence results.

Contemporary bioengineering however – precisely insofar as it is conceived as *knowledge in the making* – ought to avoid oversimplification and carelessness when it chooses linguistic constructions that are intended to introduce shadings in the discussion on sex differences. Bioethics, biopolitics, bioeconomics, and other disciplines that combine the study of life – by using ‘natural’ and ‘bio-metaphors’ – offer the possibility of reexamining scientific nomenclature, radically rejecting binaries. In this way a dialogue can be established, in which gender as a social construct and indicators of sex in the biological framework can build a new scientific paradigm that would allow the mapping of the influence of hormones on behavior, or the study of sex differences emerging from the operations of the central nervous system. The study of sexual and gender differences is not the privilege of feminists – whether one declares as such or follows feminism rejecting the moniker – nor of anyone else who intends to promote ideological and political values through its research. Perhaps therein lays the value of a book about the ‘scientific sexual difference’: because in discussing (supposedly) unequivocal scientific knowledge, it points out to the reader the cultural and societal claims that underlie the design of almost all scientific experiments dealing with sexuality.

What are the presuppositions that lead to the formation of such scientific knowledge? *Gender and the Science of Difference* is a collection of scientific texts that communicate with the general public, offering some key interpretative tools. Making use of these, it is possible to identify the conceptual make up of specific terms that cause controversy, and consequently leave behind the constraints of *The Female Brain*. In other words, it will be possible to speak of estrogen, testosterone, behavioral stereotypes and paradigms, sexual differentiation, the hypothalamic-pituitary axis and the regions of the brain that mediate aspects of sex, even without referring to the used up and ontologically overexploited “linguistic” difference between the male and female. It will be possible to wonder about the interaction that would influence reproduction or any phenomenon that is part of human sexuality in comparison, or in opposition to, other living beings. For if the beginning of (scientific) discourse about difference lies primarily in language, it is then with

the help of tools that deconstructs the scientific vocabulary that we can put into question exclusively two sex attributes in the first place, as well the decades-long resistance that ties humans to stereotypes hindering science.

It has been over ten years since Fausto-Sterling pointed to the complicated interwoven nature of scientific standardization of hormone measuring – a necessary search for terms that would ‘label’ male or female hormones, with observations that constantly belied the monosemy of terms – and the emancipatory tendency that influenced the discourse of gender identities. The debate and terminological maneuvering that occurred at the beginning of the twentieth century over the naming of the enzyme and protein that determined the sexual orientation and behavior of humans lasted over thirty years. It can be said that the entire century has passed in convoluted struggles – lasting to this day – for scientists to realize that their inherent scientific knowledge rests on specific belief systems that require not only factual justification, but justification of the language they use to articulate the reality in which humans live and work.

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